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TEMPORAL LOBE SIGNS AND REPORTS OF SUBJECTIVE PARANORMAL EXPERIENCES IN A NORMAL POPULATION: A REPLICATION

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Summary.—Correlations ($r = 0.50$) were found between the numbers of different psi (paranormal) experiences and the numbers of temporal lobe signs within a population of university students ($n = 99$). The strongest correlation of 0.60 occurred with a cluster of signs that are similar to symptoms reported by patients who show chronic foci in the mesiobasal temporal lobe. However, there were no significant correlations between numbers of different psi experiences and clusters of control items or a lie scale. Specific analyses of the 140 items of the inventory indicated only 23 reached statistical criterion ($p < .001$). Of these 17 were direct temporal lobe signs that implied deepened affect, auditory-vestibular experiences (vibrations, hearing one's name called), olfactory auras, perseveration ("forced" thinking), depersonalization, and sense of the personal. Five items involved beliefs about exotic phenomena or philosophical ideas. Only one item was from a control cluster. These results support the hypothesis that mystical or paranormal experiences are associated with transient electrical foci within the temporal lobe of the human brain. The repeated occurrence of these experiences within normal individuals may be embedded within a more complex symptomatology of temporal lobe signs.

The propensity to report paranormal or mystical experiences has been correlated with temporal lobe signs (Persinger, 1984b). A close relationship between the two phenomena is expected according to the hypothesis (Persinger, 1974, 1983) that psi experiences are generated by transient electrical foci within (primarily) the mesiobasal structures (hippocampus and amygdala) of the human temporal lobe. If this is correct, then many of the behaviors associated with patients who have repeated or chronic electrical foci within the temporal lobe, such as those diagnosed with limbic or partial complex epilepsy (Baldwin, 1970; Geschwind, 1983; Neppe, 1983) should also be evident within the histories of *normal* people who report mystical experiences. A complete overlap of symptoms is not expected since chronic foci frequently involve secondary sites of activation and may produce confounding neuropsychological deficits.

Psi experients should report experiences that are clear equivalents of ictal and interictal behaviors. Feelings of "unrealness" or of "being somewhere else" might be analogous to derealization or dreamy states. Vestibular experiences of uplifting vibrations or auditory impressions of hearing one's name

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called may be equivalent to epigastric and auditory aura, respectively. The equivalents of frank olfactory auras might be "unusual smells from nowhere." In addition, the deepening of affect might involve a sense of the personal (egocentric references) and the attribution of special significance to mundane events ("signs"), particularly during personal crisis. Viscosity or circumstantiality may be evident in verbal perseveration (gabbiness) while hypergraphia might be found in voluminous diary or poetry writing. Dissociation and partial amnesia would be evident in intermittent memory lapses. Most singularly there should be an increase in religiosity or its less egocentric and more secular equivalent—philosophical interests (particularly for exotic events).

The Personal Philosophy Inventory contains 140 items that are directly or indirectly involved with the measurement of temporal lobe signs within the normal population (Persinger, 1984a). Recent electroencephalographic studies (Makarec & Persinger, 1985) showed positive correlations of intermediate strength between scores on clusters of temporal lobe items and religious beliefs and specific electrical patterns within the temporal lobes of a normal population (as determined by MMPI profiles). The clusters of temporal lobe items did not correlate significantly with occipital lobe electrical activity, and scores for clusters of control items did not correlate with temporal lobe activity.

Although the inventory contains a cluster of items that refer to what might be considered paranormal experiences, specific statements that emphasize the more well known types of paranormal experiences are not included. Consequently, we decided to ask specific questions about different psi experiences and to determine if people who reported more of them also reported more temporal lobe signs. A total of 101 university students who were taking an evening first-year course served as subjects. There were 27 men and 74 women. The ages ranged from 17 to 48 yr., with a mean of 24 yr. Two subjects (one man, one woman) were excluded from the study. One displayed affirmative responses to silly items and one reported having an epileptic seizure.

The inventory was administered during a single setting by the second author. The students received a 2% bonus mark for participation. One week later, the subjects were asked to complete a short questionnaire that contained 10 true-false items. Five of them involved specific psi statements: (1) When a close friend or relative died, I just knew something had happened, (2) When a close friend or relative had an emotional conflict, I just knew something was wrong at about the same time, (3) I have had dreams that later turned out to be true, (4) I have seen or experienced the apparition of a close friend or member of the family, and (5) I have had vivid dreams in which I was looking through the eyes of a person who lived long ago. Subjects also described personal beliefs about ESP (extrasensory perception) on a 1-to-6 scale and specified how many times within the last year they had experienced a "psychical" event.

Both Pearson *r*s and Spearman *rho*s were determined between the psi score (0 to 5) and various clusters of the temporal lobe scale, a modification of the Lie scale items from the MMPI, and various control clusters (Persinger, 1984a). To determine which items were contributing most to the correlation, chi-squared analyses were completed for each item as a function of the psi score. As an internal comparison, the clusters from the inventory were analyzed by one-way analysis of variance according to the two telepathy items. In addition, chi-squared analyses were completed on each of the 140 items as a function of the telepathy (0, 1, 2) score. All analyses were completed by SPSS software on a DEC2020 System computer.

The major results are shown in Table 1. Since there was little discrepancy between the Spearman and Pearson coefficients, only the latter are presented. No significant correlations were noted between scores on the Psi scale and scores on the clusters than contained mundane psychological experiences ("Most of the time I am happy"), mundane proprioceptive experiences ("At times, I feel like smashing things"). There were also no statistically significant correlations between the psi score and the Lie scale, church-related items, church dogma (e.g., "Most people should be guided to ensure their spiritual development"), or the "hypergraphia" cluster (e.g., writing poetry). However, there were significant correlations ($p < .001$) between scores on the psi scale and the general temporal lobe cluster (that contained no paranormal items) and the subclusters of (a) "feeling a presence," (b) experiences of intense meaning, and (c) signs frequently associated with partial complex epilepsy (e.g., odd smells, meaningfulness off "oddball" stimuli, "presence").

TABLE 1

PEARSON CORRELATIONS BETWEEN NUMBERS OF DIFFERENT CLASSIC PSI EXPERIENCES AND DIFFERENT CLUSTERS OF TEMPORAL LOBE SIGNS (TLS) AND OTHER MEASURES

Cluster	PSI *r*	TELEP *η*	Cluster	PSI *r*	TELEP *η*
Mundane Experiences	0.06	0.11	Lie (9)	−0.05	0.02
Mundane Proprioception (8)	0.19	0.05	Egocentricity (8)	0.20	0.21
TLS (no traditional paranormal items) (29)	0.56	0.48	Perseveration (6)	0.26	0.09
Presence (4)	0.40	0.47	Write (3)	0.10	0.11
CPES† (16)	0.62	0.56	Religious Belief Dogma (9)	0.01	0.05
Intense Meaningfulness (5)	0.55	0.48	Exotic Beliefs (6)	0.40	0.35
			Paranormal (PPI items) (5)	0.51	0.43
			Church Behaviors (9)	0.12	0.14

Note.—Numbers of items per cluster are shown in parentheses. Correlations (*eta*) between number of types of "telepathy" reports and those clusters are also shown.
*r or *eta* > 0.20, $p < .05$; r or *eta* > 0.40, $p < .001$.
†Complex partial epilepsy signs.

The correlations between the scores on the psi scale and the paranormal cluster on the inventory and the fantasy or exotic belief cluster ("I would like to time travel"; "life exists on other planets") were also significant ($p < .01$). Marginally significant correlations occurred between the psi scale and the inferences of egocentricity (mostly items that emphasized the uniqueness of the person) and perseveration (inability to stop talking; not being able to stop a task when started, repeated thoughts in a brief period). The latter two measures were our equivalents of the enhanced self-centeredness and viscosity noted in some patients with chronic electrical foci in the temporal lobe (Geschwind, 1983).

Separate analyses of the telepathy claims resulted in almost identical results. There were no statistically significant correlations between the psi or telepathy scores and age (—0.04, 0.10) or sex (0.09, 0.11). There were statistically significant correlations between belief in ESP and reports of psi experiences (0.40; $p < .001$) or telepathy experiences (0.38, $p < .001$). The number of paranormal experiences (0 to 7) in the previous year ($M = 1.5 \pm 0.9$) were also correlated with the psi score ($r = 0.46$) and the telepathy score ($\eta = 0.40$). Whereas 60 of the subjects responded "no" to both items about subjective telepathic experiences, 29 said "yes" to either item and 10 said "yes" to both items.

Analyses of single items were particularly enlightening. Only those items that were statistically significant at $p < .001$ and for which there were at least 7 responders in either the yes or no category were included. Of the 23 significant items, 17 were from the temporal lobe cluster. These statements had been derived from the most frequent experiences reported by patients with partial complex epilepsy (temporal lobe focus) or by patients during deep electrical stimulation (Baldwin, 1970) of the temporal lobe. Two items involved paranormal referents and three referred to exotic beliefs. Only one item ("When I'm angry, my hands shake") was from the control clusters. None of the other items from the mundane proprioception cluster or the normal psychological experiences were significant. None of the Lie items or experiences that reflected frank epileptic states met the criterion.

Specific items are presented with the number of responders and the eta coefficients in parentheses. Our items of depersonalization included references to feeling things were not real (17, 0.42) and having experienced being somewhere else (18, 0.35). Feeling of presence included that of "a being" (27, 0.35) during the early morning hours and the close contact with a universal consciousness (14, 0.32). Vestibular sensations involved feeling lifting sensations like travelling over a rolling road (14, 0.32), pleasant vibrations before falling asleep (26, 0.30), and dreams of flying (21, 0.43). Acoustic experiences involved hearing an inner voice call one's name (12, 0.35). Clear olfac-

tory items included experiencing a smell from childhood just before falling down (7, 0.36).

Enhanced meaningfulness was indicated by the item concerned with intense bouts of meaningfulness in the early morning hours (20, 0.31). A sense of the personal or the mundane interpretation of mundane events was inferred from the item stating that a "sign" appears whenever a tough personal decision had to be made (13, 0.46). In general, the psi responders stated that telepathy was real (65, 0.36), life existed on other planets (37, 0.35), and aliens were responsible for UFOs (32, 0.28); they also said "no" to the items that ghosts and haunts do not exist (68, —0.34). Specific analyses of each item according to the subjects' responses on the telepathy score (0, 1, 2) did not differ appreciably (although many were only marginally significant) except for one item. People who responded yes to both types of telepathic experiences were also more likely to report more perseverative behaviors.

These results indicate that people who report greater numbers of different types of psi experiences (or more of them) are also more likely to display temporal lobe signs. These signs are considered qualitatively similar to but less intense and less frequent than the experiences and behavioral changes reported in subjects who have chronic or persistent intermittent electrical foci within the temporal lobe. Traditionally, the latter subjects have been diagnosed with partial complex partial, limbic, or temporal lobe epilepsy. However, we agree with Geschwind (1983) that emphasis upon a focus *within* the temporal lobe is more accurate. Classic diagnoses often do not clearly discriminate the possible confounding effects from secondary sites of activation.

This study involved the third group of subjects who have shown a clear relationship between the report of subjective psi experiences and temporal lobe signs. To check if the subjects in the present study were similar to those from previous reports (Persinger, 1984b), correlations were completed between the paranormal items (not the ones used for the psi score) in the Personal Philosophy Inventory and the numbers of temporal lobe signs. The correlation was 0.65 compared to those of 0.60 and 0.72 from the other groups (Persinger, 1984b). The mean and range for the number of yes responses for the main temporal lobe cluster (no paranormal items) was 3% to 60% ($M = 24\%$) for this group and 4% to 65% ($M = 25\%$) for previous groups.

The temporal lobe signs described in this study have been considered symptomatic of specific personality disorders, such as schizotypal classifications (Diagnostic and Statistical Manual of Mental Disorders, 1980). This disorder includes magical thinking (within which clairvoyance and telepathy are included), recurrent illusions of sensing the presence of a force or a person not actually present, depersonalization, odd speech (that is, digressive, vague, overelaborate, or circumstantial) and suspiciousness or paranoid ideation. Often

they are seen as cold or aloof with no close friends or confidants. However, no electroencephalographic (EEG) studies, particularly one in which temporal lobe transients were monitored, have been completed with a population of these patients.

A relatively forgotten work by Harper and Roth (1962) highlighted a similar cluster of symptoms; they were called the phobic anxiety-depersonalization syndrome. Harper and Roth noted the similarity between these patients and the behaviors reported by patients who were diagnosed with "nonconvulsive" forms (temporal lobe) of epilepsy. The phobic anxiety-depersonalization syndrome closely followed calamitous circumstances such as bereavement, acute physical illness, or childbirth. In 40% of the cases, features reminiscent of temporal lobe dysfunction, other than depersonalization, were present. These symptoms included deja vu experiences or perceptual disorders such as olfactory or visual hallucinations. In 60% of the cases, there were abrupt attacks of panic and fears of impending death.

Harper and Roth also found that several of the subjects who showed phobic anxiety-depersonalization had been diagnosed originally as temporal lobe epileptics, but this label was changed during the course of the treatment primarily for the lack of corroborative EEG evidence. The primary differences between Harper and Roth's patients and a comparison group with clear temporal lobe epilepsy were more frequent episodic speech disturbances and automatic behaviors in the latter group. Otherwise both groups showed comparable bouts of visceral, motor or sensory changes, episodic anger and mood changes.

Although temporal lobe epileptic patients showed more complete loss of consciousness than the group that displayed the depersonalization syndrome, there were no differences between the two groups with respect to depersonalization, deja vu, formed hallucinations, illusions about body changes, and the idea of a "presence." Between 25% to 50% of the members of either group reported these symptoms; unfortunately, there were no reference ("normal") group comparisons. The depersonalization group showed more frequent *loss* of feeling of familiarity and derealization than the group with epilepsy.

Only two of the 26 patients in the depersonalization group (for which EEGs were taken) showed abnormal records. Both indicated abnormal electrical foci within the temporal lobe. As a group, these patients should display larger numbers of spikes within the temporal lobe region when exposed to a quiet environment where intermittent, brief stimuli are presented. However, no quantitative evaluation, such as the type reported by Makarec and Persinger (1985) was given. If the temporal lobe hypothesis for psi experiences is correct, then many of these patients should also display deep electrical changes within mesiobasal structures as well (Persinger, 1983).

There were some conspicuous negative results in our study. For example, there were no significant correlations between psi scores and church behaviors or belief in classic religious dogma. Similarly, there were no significant correlations between psi scores and writing behavior. Previous results (Persinger, 1984a) indicated that people who reported intense religious experiences also showed more of the signs associated with Geschwind's (1983) description of temporal lobe personality. We suspect that whereas psi experiences may be relatively routine correlates of transient electrical foci within the temporal lobe due to personal crises (death of a loved one) or physiological extremes (fatigue, hypoglycemia), repeated religious experiences may involve more chronic alterations in activity.

During the last two years, approximately 300 subjects have been tested in the classroom situation to determine the prevalence of subjective psi experiences. During the last five years, the first author has interviewed or tested about 25 individuals who have reported frequent, profound psi experiences. These people usually score within "normal" ranges on personality inventories. We have been impressed with the conspicuous relationship between the numbers of psi experiences that people report and the numbers of temporal lobe signs. These experiences are almost invariably reported by the experient to be significant events that influence important life decisions as well as daily motivations. Certainly, such a critical and pervasive class of behaviors deserve major study.

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